

CHLORINE OR CL2

L3 12886 S L2(5A) (DETECT? OR DETERMIN? OR ASSAY? OR ANALY? OR ESTIMAT? OR
EVALUAT? OR QUANTIF? OR MEASUR? OR MONITOR? OR TEST? OR INVESTIGAT? OR
SENSE# OR SENSOR OR SENSING OR IDENTIF? OR PROBE# OR PROBING)
FILE 'REGISTRY' ENTERED AT 07:53:34 ON 15 JUN 2001

L4 1 S 314-13-6
SEL NAME L4

L5 1 S 915-67-3
FILE 'CA' ENTERED AT 07:54:22 ON 15 JUN 2001

L6 7453 S L4-5 OR E26-34 OR AMARANTH OR NAPHTHOL RED OR BORDEAUX
L7 5 S L3 AND L6
L8 597 S L3 AND REAGENT
L9 287 S L3 AND COLORIMET?
L10 812 S L8-9
L11 93 S L10 AND (DYE OR INDICATOR OR PIGMENT)
L12 7 S L10 AND AZO?
L13 13 S L10 AND MASK?
L14 63 S L10 AND BUFFER?
L15 9 S L14 AND (AMMONIA OR NH3 OR AMMONIUM HYDROXIDE OR NH4OH)
L16 6 S L14 AND (BORATE OR BORIC OR HBO3 OR BO3)
L17 114 S L7, L11-13, L15-16
L18 101 S L17 NOT PY>1999
L19 2 S AIETA E?/AU AND 1984/PY AND WATER/SO
L20 1 S CHISWELL B?/AU AND ANALYST/SO AND 1991/PY
L21 1 S GLASER J?/AU AND ENVIRON/SO AND 1981/PY
L22 4 S GORDON G?/AU AND WATER/SO AND 1988/PY
L23 2 S L22 NOT (CLOUD OR NUCLEAR)
L24 2 S GRANSTROM M?/AU AND 1958/PY
L25 7 S L19-21, L23-24 NOT L18
L26 93 S L18 NOT (MERCURIMETRIC OR MERCAPTO? OR DIANISIDI? OR ACETYLENE)
L27 84 S L26 NOT (CLEAN? OR POLYMETHINE OR OXIDASE OR TRIPHENYLMETH?)
L28 78 S L27 NOT (COAL OR FLUORINE OR ELECTROCHEM? CELL OR TETRAMETHYLBENZ?)
L29 28663 S CHLORATE OR CHLORITE OR HYPOCHOR?
L30 1828 S L29(5A) (DETECT? OR DETERMIN? OR ASSAY? OR ANALY? OR ESTIMAT? OR
EVALUAT? OR QUANTIF? OR MEASUR? OR MONITOR? OR TEST? OR INVESTIGAT? OR
SENSE# OR SENSOR OR SENSING OR IDENTIF? OR PROBE# OR PROBING)

L31 3 S L30 AND L6
L32 137 S L30 AND (REAGENT OR COLORIMET?)
L33 11 S L32 AND (DYE OR INDICATOR OR PIGMENT OR AZO? OR MASK?)
L34 13 S L32 AND BUFFER?
L35 24 S L31, L33-34
L36 22 S L35 NOT PY>1999
L37 107 S L25, L28, L36

=> d 137 bib, ab 1-107

L37 ANSWER 8 OF 107 CA COPYRIGHT 2001 ACS

AN 129:305976 CA

TI Eliminating interferences when measuring multiple disinfectants/oxidants:
masks, kinetics, and FIA

AU Gordon, Gilbert; Emmert, Gary; Gauw, Renee; Bubnis, Bernard

CS Department of Chemistry, Miami University, Oxford, OH, 45056, USA

SO Environ. Lab.: Moving 21st Century, Proc. (1997), 9/29-9/41 Publisher:
Water Environment Federation, Alexandria, Va. CODEN: 66RNA4

AB A review with 22 refs. A technol. that shows great promise for treating
drinking water is to apply multiple disinfectants/oxidants. The anal.
chem. methods needed to monitor and control treatment systems using
multiple oxidants have not been fully developed. A common problem

originates from the fact that many of the available methods are adaptations of chlorine methods and do not measure individual species, rather, the concn. of the various species are detd. by difference. When a disinfectant/oxidant is present in high concn., the existence of numerous intermediates is possible. These species are generally difficult to isolate and identify because of their rapid reaction and interactions. In certain cases, chem. masks can be used to improve the selectivity of an anal. method by isolating reactive species. Kinetic methods based on the reaction rate differences of oxidants with a reagent can also be used to identify and/or quantify multiple oxidant species.

L37 ANSWER 18 OF 107 CA COPYRIGHT 2001 ACS
AN 122:63893 CA
TI Ultra-low range chlorine determination in waters
IN Harp, Daniel L.
PA Hach Co., USA
SO U.S., 5 pp.
PI US 5362650 A 19941108 US 1993-131140 19931004
AB Trace amts. of total Cl are detd. in a sample of water by adding a Cl indicator to the sample, comprising a liq. soln. of N,N-diethyl-p-phenylenediamine; adding a buffer reagent; after a color development delay, filtering the sample; measuring light absorbance of the sample; and comparing the light absorbance with the absorbance of a control sample to which has been added a blanking reagent (malonic acid) to dechlorinate the control sample.

L37 ANSWER 27 OF 107 CA COPYRIGHT 2001 ACS
AN 115:56785 CA
TI Use of Lissamine Green B as a spectrophotometric reagent for the determination of low residuals of chlorine dioxide
AU Chiswell, Barry; O'Halloran, Kelvin R.
CS Dep. Chem., Univ. Queensland, St. Lucia, 4072, Australia
SO Analyst (London) (1991), 116(6), 657-61
AB A method for the spectrophotometric detn., using Lissamine Green B, of ClO₂ in the presence of other Cl species, i.e., free Cl, ClO₂⁻, chloramine and ClO₃⁻, was developed. The method overcomes the major problem found with the commonly used N,N'-diethyl-p-phenylenediamine method for detd. ClO₂, namely interference from free and combined Cl. The detection limit of the proposed method is 0.03 ± 0.01 ppm of ClO₂; the calibration graph is linear in 0-0.5 ppm ClO₂, and the method was verified by cyclic voltammetry.

L37 ANSWER 37 OF 107 CA COPYRIGHT 2001 ACS
AN 109:236370 CA
TI Methods of measuring disinfectant residuals
AU Gordon, Gilbert; Cooper, William J.; Rice, Rip G.; Pacey, Gilbert E.
CS Hughes Lab., Miami Univ., Oxford, OH, 45056, USA
SO J. - Am. Water Works Assoc. (1988), 80(9), 94-108
AB A review with 53 refs. on the methods for measuring disinfectant residuals in water, including continuous amperometric titrn., UV methods, iodometric titrn., colorimetry, chemiluminescence, fluorescence, and electrode methods. Comparative studies, Cl chem., ClO₂, ClO₂⁻ and ClO₃⁻, O₃, gas-phase and aq. phase O₃ measurements, and phys. methods are also discussed, and recommendations are given regarding the criteria for selecting residual monitoring techniques.

L37 ANSWER 38 OF 107 CA COPYRIGHT 2001 ACS
AN 109:196562 CA
TI A critical review of the analytical methods currently used for the

- measurement of free, combined, and oxy-chlorine species
 AU Gordon, Gilbert; Pacey, Gilbert E.; Cooper, William J.
 CS Dep. Chem., Miami Univ., Oxford, OH, 45056, USA
 SO Proc. - Water Qual. Technol. Conf. (1988), Volume Date 1987, 15(Issue
 Answers Today's Water Qual. Prof.), 1005-42 CODEN: PWQCD2; ISSN:
 0164-0755
- AB The review and discussion, with 75 refs., covers the measurement of free-,
 combined, and oxy-Cl species in water, including Cl and chloramine chem.,
 ClO₂ chem., potential interferences, Cl conversions, UV spectrometric detn.
 of Cl and chloramine, amperometric and iodometric titrns., colorimetric
 methods, electrode methods, chemiluminescence method, ClO₂- and ClO₃-
 detn., and flow injection anal.
- L37 ANSWER 40 OF 107 CA COPYRIGHT 2001 ACS
 AN 109:16318 CA
 TI Colorimetric indicator method for determination of active chlorine in
 solutions
 IN Halamek, Emil; Prikryl, Frantisek; Tesarek, Jiri; Soucek, Jan; Kellner,
 Josef; Kalaskova, Olga; Veverka, Vaclav; Kremlicka, Antonin
 PA Czech.
 SO Czech., 5 pp.
 PI CS 240787 B1 19860213 CS 1984-271 19840112
 AB The Cl content in the sample aq. soln. is calcd. from the length of time
 necessary for the decolorization of an added soln. of 3,7-bis-
 (dimethylamino)phenazothionium chloride (I) in aq. Me₂CO. For semiquant.
 estn., paper strips are impregnated with I, dipped in the Cl contg. soln.,
 and the decolorization period is compared with stds.
- L37 ANSWER 43 OF 107 CA COPYRIGHT 2001 ACS
 AN 107:161310 CA
 TI Detector for chlorine leakage from a tap water purifying apparatus
 IN Ehata, Eiichi; Iwazawa, Takeshi; Koda, Shigeo; Aoki, Yoshio
 PA Kaken Pharmaceutical Co., Ltd., Japan
 SO Jpn. Kokai Tokyo Koho, 5 pp.
 PI JP 62129744 A2 19870612 JP 1985-269107 19851129
 AB The leakage of Cl into tap water from a purifying app. is monitored with a
 detector obtained by loading an indicator, e.g., a food dye, into a
 polymer, e.g., a cation exchanger. The detector is stable for use for long
 periods of time and the indicator is not eluted by flowing tap water. Thus,
 a 0.5-cm wide and 1-cm long Selemion Cl-type cation exchanger membrane was
 immersed in 100 mL soln. contg. 10 µg/mL food dye for 2 days. The food dye
 used was Amaranth, New cocchine, Tartrazine, Sunset yellow, Fast green,
 Brilliant blue, or Indigo carmine. The immersed membrane was washed with
 distd. water and dried by placing it between filter papers to give each
 detector. Each detector was immersed in 20 mL soln. contg. 4 ppm Cl for 4
 h and each detector except that contg. Fast green was colorless.
- L37 ANSWER 46 OF 107 CA COPYRIGHT 2001 ACS
 AN 106:143778 CA
 TI Reagent for threshold chlorine detection
 IN Watanabe, Megumi
 PA Toyo Kagaku Kenkyusho K. K., Japan
 SO Jpn. Kokai Tokyo Koho, 3 pp.
 PI JP 61218942 A2 19860929 JP 1985-59432 19850326
 AB A threshold indicator for Cl comprises a mixt. of a reducing agent (e.g.,
 ascorbic acid, Na ascorbate, oxalic acid) for reducing Cl up to the
 threshold level, N,N-diethyl-1,4-benzenediamine for detecting Cl over the
 threshold level (with a color change to pink), and stabilizers such as EDTA

or CyDTA in an aq. or water-sol. org. solvent (e.g., ethanol or acetone). The threshold level can be detd. from the amt. of reducing agent used. This indicator provides easy measurement of Cl in drinking water, etc.

L37 ANSWER 47 OF 107 CA COPYRIGHT 2001 ACS
AN 106:130867 CA
TI Combined coulometric-spectrophotometric method for determining small quantities of free chlorine and bromine
AU Nikolic, Kosta; Velasevic, Ksenija
CS Zavod Fiz. Hem., Farm. Fak., Belgrade, Yugoslavia
SO Arh. Farm. (1986), 36(6), 279-81 CODEN: ARFMAC; ISSN: 0004-1963
AB A method for the detn. of small quantities of Br and Cl by using methyl orange is presented. Std. halogen solns. of known concns. were prepd. coulometrically by using electrogenerated Br and Cl in the anode compartment in the presence of properly chosen supporting electrolytes. Electrogenerated Br and Cl react with the azo group and thus methyl orange is decolorized. Since the reaction of halogen and methyl orange is quant., solns. of precisely known halogen concns. can be simply prepd. The method is practicable for the detn. of small quantities of Br and Cl, resp., in different solns.

L37 ANSWER 64 OF 107 CA COPYRIGHT 2001 ACS
AN 95:138279 CA
TI Spectrophotometric determination of chlorine dioxide
AU Harp, Daniel L.; Klein, R. L., Jr.; Schoonover, D. J.
CS Hach Chem. Co., Loveland, CO, 80537, USA
SO J. - Am. Water Works Assoc. (1981), 73(7), 387-8
AB Spectrophotometric procedures based on the oxidn. of chlorophenol red (I) [4430-20-0], a pH indicator, can det. trace amts. of ClO₂ in water. Procedures for measuring 3 concn. ranges were developed: 0-0.1, 0-0.2, and 0-1.0 mg/L. A total of 4 reagents and a lab. or portable spectrophotometer were used. The reaction of I with ClO₂ is very specific, with no interference noted from ClO₂⁻, ClO₃⁻, MnO₄⁻, Fe³⁺, chromate, chloramines, turbidity, or sample temp. At 0.46 mg ClO₂/L, the precision of the method as std. deviation is ±0.003 mg/L.

L37 ANSWER 77 OF 107 CA COPYRIGHT 2001 ACS
AN 83:52821 CA
TI Spectrophotometric method for determination of chlorine dioxide using Acid Chrome Violet potassium
AU Ascik, Kazimierz; Glinska, Marta
CS Pol.
SO Przegl. Papier. (1974), 30(12), 466, 472 CODEN: PRZPAE
AB The spectrophotometric method for detg. ~0.2-2.1 mg ClO₂/l. in H₂O is based on decolorizing a soln. of Acid Chrome Violet K (I) (≤200 mg/l.) by the action of ClO₂; 2 mole ClO₂ react with 1 mole I at pH 8.1-8.4 (NH₄Cl-NH₃ buffer). The content of ClO₂ is calcd. from the decrease of the absorbance of the sample soln. at 550 nm. The lower detn. limit is 0.12 mg ClO₂/l. by using 5 cm cells. Active Cl, NaOCl, or Ca(OCl)₂ ~ 2.7 mg/l., NaClO₂ ~ 8 mg/l., NaClO₃ ~ 5 mg/l., F⁻, and Al³⁺ do not interfere.

L37 ANSWER 80 OF 107 CA COPYRIGHT 2001 ACS
AN 80:30560 CA
TI Disposable colorimetric indicator device for measuring the concentration of chlorine in water
IN Storm, Lester F. M.
PA Sterilizer Control Royalties
SO U.S., 4 pp.

PI US 3768974 A 19731030 US 1971-126956 19710322
 AB A disposable plastic syringe contains a measured quantity of a water-sol. colorimetric reagent compn. proportioned to the vol. of a water sample which may be drawn into the syringe. The color produced in the water sample is compared to a chart std. which indicates the concn. of Cl in the water sample. The measured quantity of the reagent compn. is preferably applied as a dried printed spot to an inside surface of the syringe device. The app. is esp. useful in controlling the quality of water in swimming pools.

L37 ANSWER 82 OF 107 CA COPYRIGHT 2001 ACS
 AN 76:148440 CA
 TI Simultaneous determination of bromide and chlorine with methyl orange
 AU Laitinen, H. A.; Boyer, Kenneth W.
 CS Dep. Chem., Univ. Illinois, Urbana, Ill., USA
 SO Anal. Chem. (1972), 44(6), 920-6
 AB The reaction between methyl orange and Br or Cl involves competition between aromatic ring substitution and azo link cleavage, both of which produce a large decrease in the molar absorptivity of the 505-nm methyl orange absorption peak. However, predominant ring substitution for the Br reaction produces an increase in absorbance at 317 nm, whereas predominant azo link cleavage for the Cl reaction produces a decrease in absorbance at 317 nm. By utilizing the changes in the v-visible spectra of methyl orange solns. upon reaction with gaseous mixts. of Br and Cl in N, both the total halogen content $\leq 5 \mu\text{equiv/l.}$ and individual halogen mole fractions were detd. with 8% relative error and $\pm 11\%$ relative std. deviation. The formation of BrCl limits the total halogen concn. that can be anal. distinguished to $<5 \mu\text{equiv/l.}$ in N.

L37 ANSWER 84 OF 107 CA COPYRIGHT 2001 ACS
 AN 76:54123 CA
 TI Disposable colorimetric indicator and sampling device for liquids
 IN Davis, Ward Benjamin
 PA Sterilizer Control Royalties
 SO U.S., 3 pp.
 PI US 3620676 A 19711116 US 1969-800887 19690220
 US 3732079 A 19730508 US 1971-112234 19710203
 PRAI US 1969-800887 19690220
 AB A disposable liq. sampling device contg. an indicator such as a pH or free-Cl indicator, is formed by embossing a plastic sheet with a syringe-like cavity and closing the cavity with a second plastic sheet which is joined to the first sheet either adhesively or by heat-sealing. The liq. is drawn into the cavity by suction when an enlarged end of the cavity is compressed and released. The inner wall of the cavity has an indicator coating or a stripe of indicator-contg. flexographic ink.

L37 ANSWER 95 OF 107 CA COPYRIGHT 2001 ACS
 OREF 60:4798b-d
 TI Critical study of different methods for determination of chlorite
 AU Hashmi, M. H.; Ayaz, A. A.
 CS Pakistan Council Sci. Ind. Res., Lahore
 SO Anal. Chem. (1963), 35(13), 2194-5
 AB Five methods were carried out with 0.01N KIO₃ as the primary standard. (1) Hypochlorite (I) soln. was acidified after addn. of excess KI, let stand 5 min., and titrated with Na₂S₂O₃. The titer included I and chlorite (II) ions. (2) A known amt. of Na benzenesulfinate (III) was titrated with standard I soln. using starch-iodide as external indicator. It was necessary to add 0.5 g. NaHCO₃ and a small amt. of KBr for a distinct end

point with Bordeaux (IV) of tartrazine (V) as internal indicator. (3) Small amts. of NaHCO_3 and KBr were added to standard As_2O_3 soln., and the soln. was titrated with I soln. with V as indicator. The titer included only I ions. (4) A vol. of 10 ml. of I soln. and an excess (15 ml.) of 20% phenol soln. were mixed and let stand 5 min. Excess solid KI and 4N H_2SO_4 were added, and after 5 min. the soln. was titrated with $\text{Na}_2\text{S}_2\text{O}_3$. (5) A vol. of 10 ml. of Na hypochlorite was buffered to pH 9.3 by H_3BO_3 and an excess of solid KBr added. After 45-60 sec., $(\text{NH}_4)_2\text{SO}_4$ was added with continuous shaking, and after 10 min. excess KI and 4N H_2SO_4 . The liberated I_2 was titrated with $\text{Na}_2\text{S}_2\text{O}_3$. The titer included II ions only. The results indicate that III reacts with both I and II. The external indicators, IV and V, gave accurate results. The $(\text{NH}_4)_2\text{SO}_4$ method (5) is as reliable for the detn. of II as the combination of As_2O_3 and $\text{Na}_2\text{S}_2\text{O}_3$ (3 and 4). The I ion is converted to hypobromite at pH 9-9.4 by KBr and is destroyed by $(\text{NH}_4)_2\text{SO}_4$ leaving II ions. Phenol reacts with both I and II leaving a small amt. of available Cl .

L37 ANSWER 101 OF 107 CA COPYRIGHT 2001 ACS

OREF 53:5555g-h

TI Generation and use of chlorine dioxide in water treatment

AU Granstrom, Marvin L.; Lee, G. Fred

CS Rutgers Univ., New Brunswick, NJ

SO J. Am. Water Works Assoc. (1958), 50, 1453-66

AB The results of a questionnaire to users of ClO_2 are discussed. The principal reasons for using ClO_2 involve taste and odor problems in addn. to its replacing Cl as a disinfectant. Lowering the pH of the reaction while decreasing somewhat the yield of ClO_2 from chlorite, slightly increases the rate of the reaction. The measurement of Cl and ClO_2 are discussed.

L37 ANSWER 106 OF 107 CA COPYRIGHT 2001 ACS

OREF 41:6003i,6004a-c

TI Colorimetric determination of free chlorine with methyl orange

AU Taras, Michael

CS Dept. Water Supply, Detroit, MI

SO Anal. Chem. (1947), 19, 342-3

AB The reaction between free Cl and methyl orange occurs in the ratio of 2 mols. of free Cl to 1 mol. of dye. A colorimetric method for detg. free Cl , based on this mol. relation, is described. Directions for prepg. solns. and permanent standards are included. The method is sensitive to 0.10 p.p.m. Cl . Of the common lab. acids, only dil. HCl will support the reaction spontaneously. Near a pH of 3.0 the color of methyl orange ceases to vary with the acidity, and the resulting color is exclusively a function of the Cl content. Two drops (0.1 ml.) of 5 N HCl is usually sufficient to lower the pH to the optimum level when a 100-ml. vol. is employed. The reaction is independent of sample temp. Chloramine strengths conventionally encountered in water-works practice offer no trouble, but manganic ion above 0.05 p.p.m. causes interference. The methyl orange reagent is coequally sensitive to manganic ion and elementary Cl .

=> log y

STN INTERNATIONAL LOGOFF AT 08:47:55 ON 15 JUN 2001